UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,768	08/18/2003	Alexander V. Kukhtin	21416-93965	5089

7590 08/31/2006

Alice O. Martin
Barnes & Thornburg
P.O. Box 2786
Chicago, IL 60690-2809

EXAMINER	
FORMAN, BETTY J	

ART UNIT	PAPER NUMBER
1634	

DATE MAILED: 08/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/642,768	KUKHTIN ET AL.	
	Examiner	Art Unit	
	BJ Forman	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) *16-37* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, Claims 1-15 in the reply filed on 13 July 2006 is acknowledged.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-15 are indefinite in Claim 1 because the claim is drawn to a method of making a microarray but the method steps, as written, do not result in a microarray. Therefore it is unclear whether the method steps obtain the stated goal.

Claims 2-4 and 6-15 are indefinite in Claim 2 for the recitation "wherein the macroporous polymer substrate is synthesized" because the recitation lacks proper antecedent basis in Claim 1. Claim 1 is drawn to "obtaining" the polymer substrate. Therefore, it is unclear whether the synthesizing of Claim 2 further defines the obtaining of Claim 1.

Regarding Claim 5, is indefinite for the recitation "the biomolecules" because the recitation lacks proper antecedent basis in Claim 1. It is suggested the claim be amended to provide proper antecedent basis e.g. to depend from the biomolecules of Claim 3.

Claim 9 is indefinite for the recitation of "GMA, HEMA, EDMA, and DHDM" because the terms are acronyms, the meaning of which may change over time. It is suggested the claim be amended to recite the full term for the methacrylate.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakashima et al (U.S. Patent No. 4,352,884, issued 5 October 1982).

Regarding Claim 1, Nakashima et al disclose a method for making a macroporous polymer substrate, the method including obtaining a macroporous polymer substrate (Column 2, lines 27-47) and coating a surface with the substrate (Column 2, lines 48-60).

Regarding Claim 5, Nakashima et al disclose the method wherein biomolecules (e.g. DNA, proteins, enzymes, antibodies) are immobilized on the surface (Column 3, lines 13-34).

6. Claims 1-9, 14 and 15 are rejected under 35 U.S.C. 102(a)/(e) as being anticipated by Barany et al (U.S. Patent No. 6,506,594, issued 14 January 2003).

Regarding Claim 1, Barany et al disclose a method for making a macroporous polymer substrate (Column 10, lines 63-64), the method including obtaining a macroporous polymer

substrate (e.g. Column 21, lines 40-48) and coating a surface with the substrate (e.g. Column 24, lines 27-40).

Regarding Claim 2, Barany et al disclose the method comprising mixing the methacrylate in the presence of a porogenic solvent and initiating polymerization to form the macroporous polymer (Column 25, line 42-Column 27, line 18).

Regarding Claim 3, Barany et al disclose the method further comprising obtaining at least one immobilization chemical for linking biomolecules to the substrate (e.g. molecule "B" having desired functional group) and adding the chemical to the substrate (Column 25, line 42-Column 26, line 62).

Regarding Claim 4, Barany et al disclose the method wherein the surface is glass, metal, silane (Column 8, line, 66-Column 9, line 3; Column 24, lines 17-32; and Fig. 34).

Regarding Claim 5, Barany et al disclose the method wherein biomolecules (e.g. DNA and peptides) are immobilized on the surface (Column 7, lines 9-18).

Regarding Claim 6, Barany et al disclose the method wherein the methacrylates are monofunctional or polyfunctional (Column 27, lines 5-15).

Regarding Claim 7, Barany et al disclose the method wherein the monofunctional methacrylate is e.g. an alkyl, methacrylates, Column 27, line 7).

Regarding Claim 8, Barany et al disclose the method wherein the polyfunctional methacrylate is e.g. di- or tri- methacrylate (Column 27, lines 10-15).

Regarding Claim 9, Barany et al disclose the method wherein the methyacrylate is GMA, HEMA, EDMA or DHDM, (column 27, lines 5-15).

Regarding Claim 14, Barany et al disclose the method wherein the immobilization chemical is derivatized to include succinimide (Column 9, lines 30-33).

Regarding Claim 15, Barany et al disclose the method wherein the immobilization chemical is N-hydroxysuccinimide ether (Column 9, lines 30-33).

7. Claims 1-9 and 12-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Chang et al (U.S. Patent No. 6,994,964, filed 31 August 2000).

Regarding Claim 1, Chang et al disclose a method for making a microarray with a macroporous polymer substrate (Column 13, lines 11-18 and Example 1-2), the method including obtaining a macroporous polymer substrate (e.g. HEMA) and coating a surface with the substrate (e.g. glass or silicon, Column 21, lines 25-56).

Regarding Claim 2, Chang et al disclose the method comprising mixing the methacrylate in the presence of a porogenic solvent (Column 15, lines 21-62) and initiating polymerization to form the macroporous polymer (Column 13, line 20-Column 14, line 10).

Regarding Claim 3, Chang et al disclose the method further comprising obtaining at least one immobilization chemical for linking biomolecules to the substrate (e.g. activating group) and adding the chemical to the substrate (Column 5, lines 3-16).

Regarding Claim 4, Chang et al disclose the method wherein the surface is glass or silica (Column 2, lines 4-6).

Regarding Claim 5, Chang et al disclose the method wherein biomolecules (e.g. DNA, proteins, peptides, lipids, polysaccharides, etc) are immobilized on the surface (Column 16, lines 24-35).

Regarding Claim 6, Chang et al disclose the method wherein the methacrylates are monofunctional or polyfunctional (Column 14, lines 16-58).

Regarding Claim 7, Chang et al disclose the method wherein the monofunctional methacrylate is e.g. an alkyl, methacrylates, (Column 2, lines 10-33 and Column 6, lines 42-67).

Regarding Claim 8, Chang et al disclose the method wherein the polyfunctional methacrylate is di-methacrylate i.e. branched (Column 2, lines 10-33 and Column 6, lines 42-67).

Regarding Claim 9, Chang et al disclose the method wherein the methacrylate is HEMA (Example 1, Column 21, lines 25-56Column 27, lines 5-15).

Regarding Claim 12, Chang et al disclose the method wherein the porogenic solvent is an aliphatic alcohol (Column 15, lines 50-52).

Regarding Claim 13, Chang et al disclose the method wherein the porogenic solvent is an aromatic alkyl derivative (Column 15, lines 21-62).

Regarding Claim 14, Chang et al disclose the method wherein the immobilization chemical is derivatized to include succinimide (Column 5, lines 10-16).

Regarding Claim 15, Barany et al disclose the method wherein the immobilization chemical is N-hydroxysuccinimide ether (Column 5, lines 10-16).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al (U.S. Patent No. 6,994,964, filed 31 August 2000) in view of Huang et al (U.S. Patent No. 3,904,572, issued 9 Sept 1975).

Regarding Claims 10 and 11, Chang et al disclose a method for making a microarray with a macroporous polymer substrate (Column 13, lines 11-18 and Example 1-2), the method including obtaining a macroporous polymer substrate (e.g. HEMA) and coating a surface with the substrate (e.g. glass or silicon, Column 21, lines 25-56).

Chang et al teach the polymerization is performed in the presence of an porogenic solvent e.g. aromatic hydrocarbons and alcohols (Column 15, lines 21-62) but they do not specifically teach the solvents are aromatic alcohols e.g. cyclohexane. However, the courts have stated with regard to chemical homologs that the greater the physical and chemical similarities between the claimed species and any species disclosed in the prior art, the greater the expectation that the claimed subject matter will function in an equivalent manner (see *Dillon*, 99 F.2d at 696, 16 USPQ2d at 1904).

Huang et al teach organic solvents used in the process of methacrylate polymerization include aliphatic alcohols e.g. cyclohexanol (Columns 3-4) and therefore define cyclohexanol as an aliphatic alcohol that functions as an organic solvent in methacrylate polymerization.

Because Chang et al teach organic solvents are used in the polymerization (e.g. aromatic and/or alcohols e.g. aliphatic alcohol, Column 15, lines 50-52); because Huang et al teach useful aliphatic alcohols include cyclohexanol; and because the courts have stated that functional equivalents would provide a reasonable expectation of success, one of ordinary skill in the art would have been motivated to use aromatic alcohols e.g. cyclohexane as the organic solvent in the method of Chang et al with a reasonable expectation of success.

Conclusion

10. No claim is allowed.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

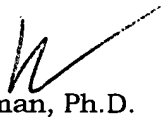
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.



BJ Forman, Ph.D.
Primary Examiner
Art Unit: 1634
August 29, 2006